Advanced PDF workflows with ColdFusion and LiveCycle

Outline

- About PDF

- Generating PDF from ColdFusion

- Working with PDF forms in ColdFusion

- Workflows with XFA forms

- Designing XFA forms with LC Designer

- Submitting form data from a PDF to ColdFusion

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Before PDF

- PostScript

- Document language from Adobe

- Contains complex instructions (loops, conditionals etc.)

- Complex

- Heavy

Portable Document Format

- Developed by Adobe in 1993

- Alternative for PostScript

- Lightweight

- Format fidelity

- Consists of:
  - PostScript page description system
  - Fonts
  - Packaging format in a single file

PDF versions (1)

- 1993 version 1

- 1996 version 1.1
  - passwords

- 1996 version 1.2
  - AcroForms

- 2000 version 1.3
  - Signatures
  - Javascript

PDF versions (2)

- 2001 version 1.4
  - Forms Data Format
- 2003 version 1.5
  - XML Forms Architecture
- 2004 version 1.6
  - 3D
- 2006 version 1.7 (ISO 32000-1:2008)
  - collections

PDF versions (3)

- 2008 version 1.7 Extension Level 3
- 2009 version 1.7 Extension Level 5
- 20?? ISO 32000-2

Generating PDF from ColdFusion

- CF reports

- cfdocument

- cfpdf

CF reports

- CF Reports are build using the ReportBuilder
- Output formats include:
  - PDF
  - RTF
  - Excel
- .cfr files can be called directly from the browser
- Cfreport tag for executing Crystal Reports or CF reports

cfdocument

- Generates PDF (or FlashPaper)
- Does HTML conversion natively through iText
  - But al the interactive elements are removed
- Conversion of Office documents through OpenOffice

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cfpdf

- Tag for manipulating PDFs:
  - Merge (append)
  - Delete pages
  - Watermark
  - Password protect
  - Optimize
  - Add/remove headers/footers
  - Read/change metadata

cfpdf operation

```
<cfpdf action="merge"
        source="c:\PDFdocs\myBook\Chap1.pdf,
        c:\PDFdocs\myBook\Chap2.pdf,
        c:\PDFdocs\myBook\Chap3,pdf"
        destination="myBook.pdf"
        overwrite="yes">
```

DDX sample

```xml
<DDX xmlns="http://ns.adobe.com/DDX/1.0/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"
xsi:schemaLocation="http://ns.adobe.com/DDX/1.0
/ coldfusion_ddx.xsd">
        <PDF result="Out1">
                <PDF source="Title"/>
                <TableOfContents/>
                <PDF source="Doc1"/>
                <PDF source="Doc2"/>
                <PDF source="Doc3"/>
        </PDF>
</DDX>
```

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But all of these are non-interactive

cfpdfform

- Tag to read/update data in PDF forms
- Requires existing PDF template with form fields in definition
- Supports
  - AcroForms
  - XFA forms

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AcroForms

- Introduced in PDF 1.1
- Support 'fixed' layout forms
- Supported by most third party PDF readers / libraries
- Build them with Adobe Acrobat

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XML Forms Architecture (XFA)

- Originally developed by JetForms
- Submitted and accepted as W3C standard
- Supported by Adobe PDF applications:
  - Acrobat
  - Reader
  - LiveCycle
  - ColdFusion
- Limited support by iText (fill only)
- Created in LiveCycle Designer (part of Acrobat)

XFA lifecycle

XFA template

- from PDF container

Form

- fields
- data

XFA data

- from PDF container
- or from PDF application

Layout

- pages
- displayed to user

PDF background

- from PDF container

Demo 1

- Developing a form in LiveCycle Designer
    - Using form objects
    - Events
    - Flowed layout

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Workflows

- Business process workflow:

A business process or business method is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers.

From http://en.wikipedia.org/wiki/Business_process

- Architect - Designer – Developer workflow

Business process workflow

Workflow for an expenses process:

- Employee fills out expenses form

- Employee sends expenses form to manager

- Manager approves expenses

- Manager sends form to accounting

- Accounting pays expenses

- Accounting files expenses form

Architect – Designer – Developer workflow

- Architect defines data model for form
  - Employee information
  - Expenses information
  - Workflow information
- Designer designs form interface
- Developer develops backend workflow

Form Data Model

- Data model created by architect / business analyst
- Many ways to express a data model
  - UML
  - XSD
  - Sample data
- For this we prefer to use an XSD due to support in CF and LiveCycle Designer

Sample XSD

```xml
<xs:element name="expenses">
 <xs:complexType>
  <xs:sequence>
   <xs:element ref="form:expenseLine" maxOccurs="unbounded"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
<xs:element name="expenseLine">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="date" type="xs:date"/>
   <xs:element name="amount" type="xs:decimal"/>
   <xs:element name="description" type="xs:string"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
<xs:simpleType name="typeJN">
 <xs:restriction base="xs:string">
  <xs:enumeration value="J"></xs:enumeration>
  <xs:enumeration value="N"></xs:enumeration>
 </xs:restriction>
</xs:simpleType>
```

Demo 2

- Developing a LiveCycle form based on an XSD
  - Form field definitions
  - Repeating data
  - Form validation rules

Submitting data from a PDF to ColdFusion

- Add a button to the PDF

- Make the type "Submit"

- Destination:
    - http URL
    - mailto URL

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PDF data type

- XML Data Package

- PDF (needs reader extensions)

- XML Data

- URL-Encoded data

Reading form data

- cfpop the mailbox with the emails
- Loop over the attachments
- Check for the .xml extension
- Validate the schema with XMLValidate()

Reading form data

- Use cfpdfform

- Read / write all data at once in XML format from the pdf scope (or the PDF variable):

```
<cfpdfform action="read"
       source="#pdf.content#"
       result="stData" />
```

Writing form data

- Use cfpdfform to populate a form with data
- Always use "overwritedata" to prevent errors

```
<cfpdfform
        action="populate"
        source="#PDFTemplate#"
        xmldata="#XMLTemplate#"
        overwritedata="yes" />
```

Demo 3

- Building a workflow for a PDF in ColdFusion:
  - Prefill form for process
  - Different datasets
  - Different look and feel
  - Receive form submission
  - Validate
  - Process

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Extending with LiveCycle ES

- LiveCycle ES is the Enterpise PDF solution
- It can do much more with XFA forms
  - Merge
  - Flatten
  - Assemble
  - Convert to HTML forms
  - Convert to Flex forms

cfpdfform & XFA benefits

cfpdfform & XFA benefits

- People think PDF looks respectable

- Validation all around:

  - Form is bound to schema

  - Process is bound to schema

- Separation of responsibilities

  - Data generation is separate from PDF fill

- Clear development workflow

Risks

- PDF reader support
  - If non-Adobe clients need to be supported it is a no-go

- Charsets
  - cfpdfform is much more picky as XMLValidate()

- Client can not save form data
  - Need to extend the PDF for Reader
    - Mind the licensing